

### **Remarks**

Prior to this amendment, claims 3-11 were pending. Claims 3-5 and 8 are amended herein. Support for the amendment of claims 3 and 5 can be found in the specification at least at paragraphs [0015], [0019], [0020] and [0058].

No new matter is introduced by the foregoing amendments. After entry of this amendment, **claims 3-11 are pending in this application (of which claims 4 and 8-10 are withdrawn)**. Consideration and allowance of the pending claims is requested.

#### *Request under 37 CFR 1.48(b), to Delete Persons No Longer Inventors Due to Amendment or Cancellation of Claims*

Applicants hereby request that the inventorship for this application be corrected. This filing is accompanied by the processing fee required by §1.17(i). Due to the amendment submitted March 29, 2007, the invention(s) of the following six inventors is/are no longer claimed in this application:

Nancy Anne Federspiel, Allan Lammers, Xing Liang Liu, Stanley R. Bates, Christina Westerlund, and Jonathan R. Fitch.

Thus, the correct and complete list of inventors for the currently claimed subject matter is:

Catherine Anderson, Stephen Aaron Lee, Kerrie Powell, Pilar Puente, Jennifer Lee Rhein, Philip Reid Timmons, and Vincent Paul Mary Wingate.

#### *Claim Rejections under 35 U.S.C. §112, first paragraph*

Claims 3 and 5-7 were rejected under 35 U.S.C. §112, first paragraph, as allegedly containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Specifically, the Office action alleges that “the claims as amended do not recite any of the disclosed Arabidopsis sequences or any structure function element that would distinguish the claimed Arabidopsis ortholog from other known or

unknown pathogen/drought resistant genes from *Arabidopsis*.” Applicants respectfully traverse this rejection.

Claims 3 and 5 are now directed (in part) to a PRDT1 polypeptide comprising “an *Arabidopsis* ortholog of SEQ ID NO:2, wherein the ortholog has at least 60% sequence identity to the sequence set forth as SEQ ID NO: 2, comprises a SANT domain, and has DNA-binding activity . . .” Claims 6-7 depend, directly or indirectly, from claim 5 and incorporate all of the limitations thereof. Applicants note that a sequence alignment between SEQ ID NO: 13 (an *Arabidopsis* ortholog) and SEQ ID NO: 2 identified that there is 66% sequence identity between these sequences. Moreover, GenBank identified a SANT domain between residues 11-54 of SEQ ID NO: 2 (Exhibit A) and residues 14-60 of SEQ ID NO: 13 (Exhibit B). In addition, both polypeptides are DNA-binding proteins.

The specification clearly describes transgenic plants comprising “an *Arabidopsis* ortholog of SEQ ID NO: 2, wherein the ortholog has at least 60% sequence identity to the sequence set forth as SEQ ID NO: 2, comprises a SANT domain, and has DNA-binding activity, wherein said transgenic plant has increased drought tolerance relative to control plants . . .” (as stated in amended claim 3) and methods of producing increased drought tolerance in a plant using such an *Arabidopsis* ortholog (amended claim 5). For example, the specification states that the PRDT1 polypeptides include “a SANT DNA-binding domain at approximately amino acids 8-60” (paragraph [0057]) and that myb proteins (such as the PRDT1 myb-related protein) belong to the “SANT domain family that specifically recognize the sequence YAAC(G/T)G (Aasland et al. 1996, Trends Biochem. Sci. 21:87-88)” (paragraph [0058]). The specification also clearly states that “a PRDT1 polypeptide comprises a polypeptide sequence with at least . . . 60% . . . identity to the polypeptide sequence of SEQ ID NO:2 over its entire length and comprises a SANT domain” (paragraph [0020]).

The specification at paragraph [0057] also teaches that functional domains of the PRDT1 polypeptide (such as a SANT domain) can be identified using algorithms well known to those of skill in the art (such as the PFAM program). Moreover, the SANT domain was well-known to those of skill in the art at the time the application was filed (see, for example, Aasland *et al.*

1996, *Trends Biochem. Sci.* 21:87-88). Thus, based on the teachings of the specification, one of skill in the art would be able to identify which *Arabidopsis* orthologs having at least 60% sequence identity with SEQ ID NO: 2 also comprise a SANT domain.

In addition, the specification at paragraph [0015] clearly describes that functionally active orthologs of the PRDT1 polypeptide (SEQ ID NO: 2) cause (i) “an altered . . . drought tolerance phenotype when mis-expressed in a plant,” and (ii) are “capable of rescuing defective (including deficient) endogenous PRDT1 activity when expressed in a plant or in plant cells,” and (iii) that “[s]ome preferred PRDT1 polypeptides display DNA binding activity.” Thus, the specification also clearly describes chemical, physical, or any other relevant identifying characteristics that relate to orthologs of the PRDT1 polypeptide (SEQ ID NO: 2).

Finally, Applicants submit that the term “ortholog” is adequately described in the specification (see, for example, the specification at paragraph [0025]).

Based on the above discussion, and as the claims are now directed to specific *Arabidopsis* orthologs, and not any *Arabidopsis* orthologs, Applicants submit that the specification provides an adequate written description for the current claimed invention. The provided written description would allow a skilled artisan to predictably determine what would be the identity of the members of the claimed genus. Applicants respectfully submit that one of skill in the art reading the specification would recognize that Applicants had possession of the claimed invention in its full scope at the time the application was filed. Accordingly, Applicants respectfully request that this rejection of claims 3 and 5-7 for lack of adequate written description be withdrawn.

#### *Claim Rejections under 35 U.S.C. §102(e)*

Claims 3 and 5-7 are rejected under 35 U.S.C. §102(e) as allegedly being anticipated by Thomashow *et al.* (U.S. Patent No. 6,417,428) because Thomashow *et al.* “teach plants transformed with an expression vector comprising a DNA from *Arabidopsis thaliana* encoding a protein having an AP2 domain capable of binding to the DNA regulatory sequence and inducing expression of one or more environmental stress tolerance genes; and a drought inducible

promoter . . . The DNA of the prior art encoding a protein having AP2 domain is considered to be an ortholog of SEQ ID NO: 2.” Applicants respectfully traverse this rejection.

Applicants note that only three of the AP2 domain polypeptide sequences disclosed in Thomashow *et al.* are *Arabidopsis* sequences (SEQ ID NOs: 2, 13, and 15) and, according to NCBI BLAST alignments, none of these sequences has significant sequence identity with Applicants’ SEQ ID NO: 2. As Thomashow *et al.* does not teach *Arabidopsis* orthologs having at least 60% sequence identity with SEQ ID NO: 2, Thomashow *et al.* does not and cannot anticipate the claims as amended. In light of the amendments to claims 3 and 5, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 3 and 5-7.

#### *Nonstatutory Obviousness-Type Double Patenting*

Claims 3, 5-7, and 11 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claims 1-7 and 11-14 of copending Application No. 10/512,600 because the conflicting claims are not patentably distinct from each other. The Office action further alleges that “the only difference between the two applications is that the DNA encoding SEQ ID NO: 2 has been used in the instant application to induce drought resistance in the transgenic plants, while the same DNA is used in the copending application to induce pathogen resistance in the transgenic plants. However, both the drought and disease resistance activities are inherent properties of SEQ ID NO: 2.” Applicants respectfully traverse this rejection.

Applicants submit that one of skill in the art would not have known that a polypeptide having pathogen resistance activity would also be able to induce a drought tolerance phenotype in transgenic plants. For example, the subject specification discloses that in order to test for pathogen resistance the transgenic plants must be grown first “in a dew room at 18°C and **100% humidity** for 24 hours” followed by “**60% relative humidity** with ten-hour long light period for six days” (emphasis added; page 17, lines 28-31 and page 21, lines 24-26, Application No. 10/512,600). In contrast, testing for drought tolerance requires that drought stress be imposed on plants by **withholding water** for up to twenty-five days (paragraphs [0052] and [0083]). Given the daily requirement for significant amounts of water under the pathogen-resistance screening

conditions disclosed in Application No. 10/512,600, it would not have been obvious based on the teachings of this reference that the transgenic plants disclosed in the reference would be resistant to drought conditions, nor would one of skill in the art have thought to test the transgenic plants for drought resistance. Moreover, there is no teaching in Application No. 10/512,600 that SEQ ID NO: 2 has properties related to drought tolerance, nor does Application No. 10/512,600 disclose drought-inducible promoters or how to test for drought tolerance. Thus, as the cited reference does not teach or suggest that SEQ ID NO: 2 induces drought tolerance or that a drought-inducible promoter should be used to express SEQ ID NO: 2 in transgenic plants, there would be no reasonable expectation that plants transformed with a transformation vector comprising SEQ ID NO: 2 and the drought-inducible promoter would express this phenotype.

As discussed above, the Office action states that the “drought and disease resistance activities are inherent properties of SEQ ID NO: 2” (Office action, page 6). However, Applicants submit that the inherency rejection does not apply to the claimed methods of use (claims 5-7), particularly because the claims are directed to a novel use of an unforeseen property of a known sequence.

Even if the Office persists in provisionally rejecting current method claims 5-7 on the ground of nonstatutory obviousness-type double-patenting, Applicants submit that the claimed methods are patentably distinct from claims 1-7 and 11-14 in Application No. 10/512,600. For example, there is no teaching in Application No. 10/512,600 of methods to generate plants having phenotypes other than pathogen resistance. Nor is there any teaching in Application No. 10/512,600 that introducing into progenitor cells a plant transformation vector, comprising a nucleotide sequence that encodes an amino acid sequence set forth as SEQ ID NO: 2, an amino acid sequence having at least 95% sequence identity to SEQ ID NO: 2, or the claimed *Arabidopsis* ortholog of SEQ ID NO: 2, generates a transgenic plant having a drought tolerance phenotype. Finally, the cited reference does not teach how to test for drought tolerance. Thus, as the cited reference does not teach or suggest how to generate a transgenic plant having a drought tolerance phenotype, there would have been no reasonable expectation, based on Application No. 10/512,600, that the claimed methods could be used to generate transgenic plants expressing this phenotype.

Applicants remind the Examiner that the claims in Application No. 10/512,600 are not yet allowed. Thus, any issues related to the provisional double-patenting rejection that are not resolved by this Amendment and Response can be addressed in that case.

In view of the amendments and arguments made herein, Applicants request reconsideration and withdrawal of the provisional nonstatutory obviousness-type double patenting rejection based on the cited prior art reference.

### **Conclusion**

Based on the foregoing amendments and arguments, the claims are in condition for allowance and notification to this effect is requested. If for any reason the Examiner believes that a telephone conference would expedite allowance of the claims, please telephone the undersigned at the telephone number listed below.

Respectfully submitted,

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